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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/814,343 | 04/01/2004 | Yoshiaki Sakagami | 59406.00017 | 5345 |
| 32294 | 7590 | 02/08/2007 | | |
| SQUIRE, SANDERS & DEMPSEY L.L.P. 14TH FLOOR 8000 TOWERS CRESCENT TYSONS CORNER, VA 22182 | | | EXAMINER | |
| | | | RICE, ELISA M | |
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| SHORTENED STATUTORY PERIOD OF RESPONSE | | MAIL DATE | DELIVERY MODE | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | |
|------------------------------|-----------------|-----------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/814,343 | SAKAGAMI ET AL. |
| | Examiner | Art Unit |
| | Elisa M. Rice | 2609 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-6 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 01 April 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>4/1/2004</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. The foreign priority claim filed March 31, 2003 was not entered because the foreign priority claim was not filed during the time period set forth under 35 U.S.C. 119 (a)-(d) or (f). Applicant may claim benefit of an earlier filing date of a foreign application under 35 U.S.C 119 (a)-(d) or (f) provided the application is filed within 12 months from the earliest date on which such foreign application was filed.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 4, and 5 rejected under 35 U.S.C. 102(e) as being anticipated by Kuno (US 5,802,494).

Regarding claim 1, Kuno discloses an image transmission system for a mobile robot, comprising:

a camera for capturing an image as an image signal (Figure 2B, 31a and 31b, "video cameras").

a microphone for capturing sound as a sound signal ("The robot 5 has a video camera in its head, a microphone", column 3, lines 40-41)

human detecting means for detecting a human from the captured image and/or sound ("As can be understood from FIG. 16, the facial features of the subject, e.g., the eyebrows, the eyes, the nose, the ears, the mouth, have the position relation which is common to human beings. This relation is defined by the positions of individual facial features with respect to the vertical and horizontal directions, and also by the distances between the facial features. The designated local module or the host computer 6d can, therefore, determine the positions of the facial features detected in step f4, in accordance with the data representing said position relation. To detect the images of the facial features, the vertical center line of the subject's face is first detected from the outline of the subject's head, the angle by which the subject faces away from the video camera 31a is then determined from the position of the center line and the position of the top of the head. More specifically, the host computer 6d determines the angle from the positions of the vertical center line of the face and the top of the head, and then

determines the position relation among the facial features. If any facial feature detected is not located at the position it should take, it will be identified in accordance with its position with respect to those of the other facial features detected later. If the facial feature cannot be identified, the local module assigned to the region in which the facial feature may exists processes the video signals representing the region, for the second time.”)

a power drive unit for moving the robot toward the detected human (“Another drive mechanism is incorporated in the trunk of the robot 5. When this mechanism is actuated, the robot 5 moves in any direction on the floor”, column 28, lines 27-29);

an image cut out means for cutting out an image of the detected human according to information from the camera; (“the image of the subject's head is extracted from the input image (Figure 11A)”, column 9, lines 43-44) ; and

image transmitting means for transmitting the cut out human image to an external terminal (“and the signals showing the subject's image are transmitted to a CRT display installed in a monitor room”, column 1, lines 60-62)

Regarding claim 2, Kuno discloses an image transmission system according to claim 1, wherein the system is adapted to detect a moving object from the image signal obtained from the camera, and determine that the object is a human from color

information of the moving object (Figure 19B, i5 "Does the input image include an image of a moving object?"; "the pixels of skin color and hair color are extracted from the pixels of other colors", column 8, lines 20-22).

Regarding claim 4, Kuno discloses an image transmission system according to claim 1, further comprising means for monitoring state variables including a current position of the robot; the image transmitting means transmitting the monitored state variables in addition to the cut out human image (FIG. 28 is a diagram illustrating how to determine the position of the robot, column 3, lines 16-17, "The physician looks at the subject's face being displayed on the display of the monitor console and also checks the physical conditions being displayed on the other displays of the console, in order to decide what he or she should do for the subject.", column 5, lines 26-30, "the circuit 40 starts transmitting the image data representing the image of the subject, to the monitor section 2", column 5, lines 14-16, "Meanwhile, the electronics sensors 33 installed in the sickroom, such as the hemodynamometer and the electrocardiograph, both attached to the subject, output diagnosis signals, representing the physical conditions of the subject. The video signals and the diagnosis signals are input to the signal processor 32 incorporated in the data-processing/control section 4. The processor 32 processes these input signals, thereby generating image data and diagnosis data. The image data and the diagnosis data are supplied to the abnormality decision circuit 34 incorporated in the robot 5.", column 5, lines 10-20)

Regarding claim 5, Kuno discloses an image transmission system according to claim 1, wherein the system is adapted to have the robot direct the camera toward the position of the detected human ("Since the video camera 31a built in the robot 5 is directed to only the subject on the bed", column 7, lines 30-31).

Claim Rejections - 35 USC § 103

Claims 1, 2, 5, and 6

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. **Claims 1, 2, 5 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Higaki et. al. (US 2004/0028260 A1) and Kuno (5,802,494).

In Regards to Claim 1:

Higaki discloses an image transmission system for a mobile robot, comprising:
a camera for capturing an image as an image signal ("employing 2-color CCDs, with L
and R denoting the left side camera and the right side camera respectively", paragraph
41; Figure 1, 1L and 1R).

a microphone for capturing sound as a sound signal ("reference symbol 21 denotes a
microphone that picks up the voice of a person speaking", paragraph 41; Figure 1, 21)

human detecting means for detecting a human from the captured image and/or sound
("characteristic features such as the face and the hands of a person can be detected
from the extracted outline information", paragraph 13 and "voice recognition section
which recognizes the content of the utterance picked up by the microphone", paragraph
41).

a power drive unit for moving the robot toward the detected human ("a drive control
section", paragraph 41; Figure 1, 9);

an image cut out means for cutting out an image of the detected human
according to information from the camera ("reference symbol 54 denotes an outline
extraction section which extracts an outline"; Figure 1, 54) ; and

Higaki does not disclose an image transmitting means for transmitting a human image to an external terminal.

However, Kuno (5,802,494) does disclose an image transmitting means for transmitting a human image to an external terminal ("and the signals showing the subject's image are transmitted to a CRT display installed in a monitor room", column 1, lines 60-62, "the image of the subject's head is extracted from the input image (Figure 11A)", column 9, lines 43-44)

It would have been obvious at the time of the invention to a person of ordinary skill in the art to combine the image transmission system for a mobile robot with the elements as disclosed by Higaki with an image transmitting means for transmitting a human image to an external terminal taught by Kuno in order to monitor an individual from a remote location and thereby increase the chance of finding a lost child. ("The CRT display displays the image of the subject, whereby a physician in the monitor room can observe the subject", column 1, lines 22-24)

In Regards to Claim 2:

Higaki teaches an image transmission system according to claim 1, wherein the system is adapted to detect a moving object from the image signal obtained from the camera ("a moving object ID at 116", paragraph 87 and determine that the object is a human from color information of the moving object ("make an area inside the outline having a

predetermined color a candidate for a hand of a person", paragraph 17, "denotes a face recognition section which recognizes a person's face from the color image, the skin-color area image", paragraph 19)

In Regards to Claim 5:

Higaki discloses an image transmission system according to claim 1, wherein the system is adapted to have the robot direct the camera toward the position of the detected human ("obtains the pan angle and tilt angle of the cameras 1L and 1R (step S81). The line of sight instruction section sends the obtained pan angle and the tilt angle to the action control section 9 (step S82). As a result, the cameras 1L and 1R always come to face the direction of the head of the person who issues the instruction "come", it becomes possible to track the person", paragraph 94)

In Regards to Claim 6:

Higaki discloses an image transmission system according to claim 1, wherein the system further comprises means for measuring a distance to the detected human according to the information from the camera, and providing a target of a movement to said mobile robot ("a distance calculation device that calculates a distance to the body being the candidate, from distance information of each pixel within the outline in the image", paragraph 12 and "the movement instruction section 64, based on the moving object data 90, tracks the person who instructed "come" (step S95)", paragraph 95).

Claim 3

6. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Higaki et. al. (US 2004/0028260 A1) and Kuno (5,802,494) as applied to claim 1 above, and further in view of Shinichi (2000-326274).

In Regards to Claim 3:

While the Higaki Kuno combination discloses a microphone as described above, the Higaki and Kuno combination does not teach determining a direction of a sound source from the sound signal obtained from the microphone.

However, Shinichi does teach a system, in the same problem solving area of locating a source of sound, that detects the direction of a sound source ("direction of a sound source is detected", paragraph 5).

It would have been obvious at the time of the invention to a person of ordinary skill in the art to combine the image transmission system for a mobile robot with the elements as disclosed by Higaki and Kuno in the claim 1 discussion above with a system as taught by Shinichi that is adapted to determine a direction of a sound source from the sound signal obtained from the microphone because this directional information provided by the sound signal allows the robot an additional way to be able to locate the person ("turned the robot in this direction" paragraph 5 of Shinichi and "person retrieval processing" paragraph 5 of Shinichi).

Claim 4

7. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Higaki et. al. (US 2004/0028260 A1) and Kuno (5,467,403) as applied to claim 1 above, and further in view of Ishii (6,278,904).

In Regards to Claim 4:

Higaki, as part of the Higaki and Kuno combination applied to claim 1 above, teaches means for monitoring state variables ("the person information map 10 defines the relative position between the person and the autonomous relative position between the person and the autonomous robot R, in order to grasp where the person issuing instructions currently is. The person information map 110 includes: an individual person ID 111 for uniquely specifying persons, a relative position to self 112, a face object ID 113, and individual person ID 114, a posture ID 115, a moving object ID 116, a face position coordinate 118 in the real space, a hand position coordinate 119, a distance to self 120, a relative angle to self 121, an outline contact point coordinate 122, and a head vertex point coordinate 123", paragraph 87, "the operation for renewing the person information map in the object integration section 62 is described with reference to Figure 15", paragraph 88 and "the operation for renewing the person information map in the object integration section 62 is described with reference to Figure 15", paragraph 88).

Higaki does not disclose an image transmitting means transmitting the monitored state variable including current position of the robot.

Ishii does disclose an image transmitting means transmitting the monitored state variables including the current position of the robot ("In the first embodiment, the information captured through the image sensor 11 and the audio sensor 12 is used for the purpose of detecting a current position of the robot 10 in order for the robot 10 to move around all objects to be monitored or to monitor a specified object. The information captured through the image sensor 11 and the audio sensor 12 is also stored in the robot 10, or transferred externally through the communications device 19 and stored in an external device, as the monitoring data", column 5, lines 10-15).

It would have been obvious at the time of the invention to a person of ordinary skill in the art to combine the image transmission system for a mobile robot with the elements as disclosed by Higaki and Kuno in the claim 1 discussion above with an image transmitting means transmitting the monitored state variables including current position of the robot as taught by Ishii, in order to be able to observe a predetermined object and keep track of its location and other state variables of interest ("detecting a current position of the robot 10 in order for the robot to move around all objects to be monitored or to monitor a specified object" and "the information captured through the image sensor 11 and the audio sensor 12 is also stored in the robot 10, or transferred externally

through the communications device 19 and stored in an external device, as the monitoring data", Ishii, column 5, lines 10-15).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elisa M. Rice whose telephone number is (571)270-1580. The examiner can normally be reached on 8:00a.m.-5:30p.m. EST Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian P. Werner can be reached on (571)272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



**BRIAN WERNER
SUPERVISORY PATENT EXAMINER**

Elisa Rice *ER* 1/29/2007
Assistant Patent Examiner
2609